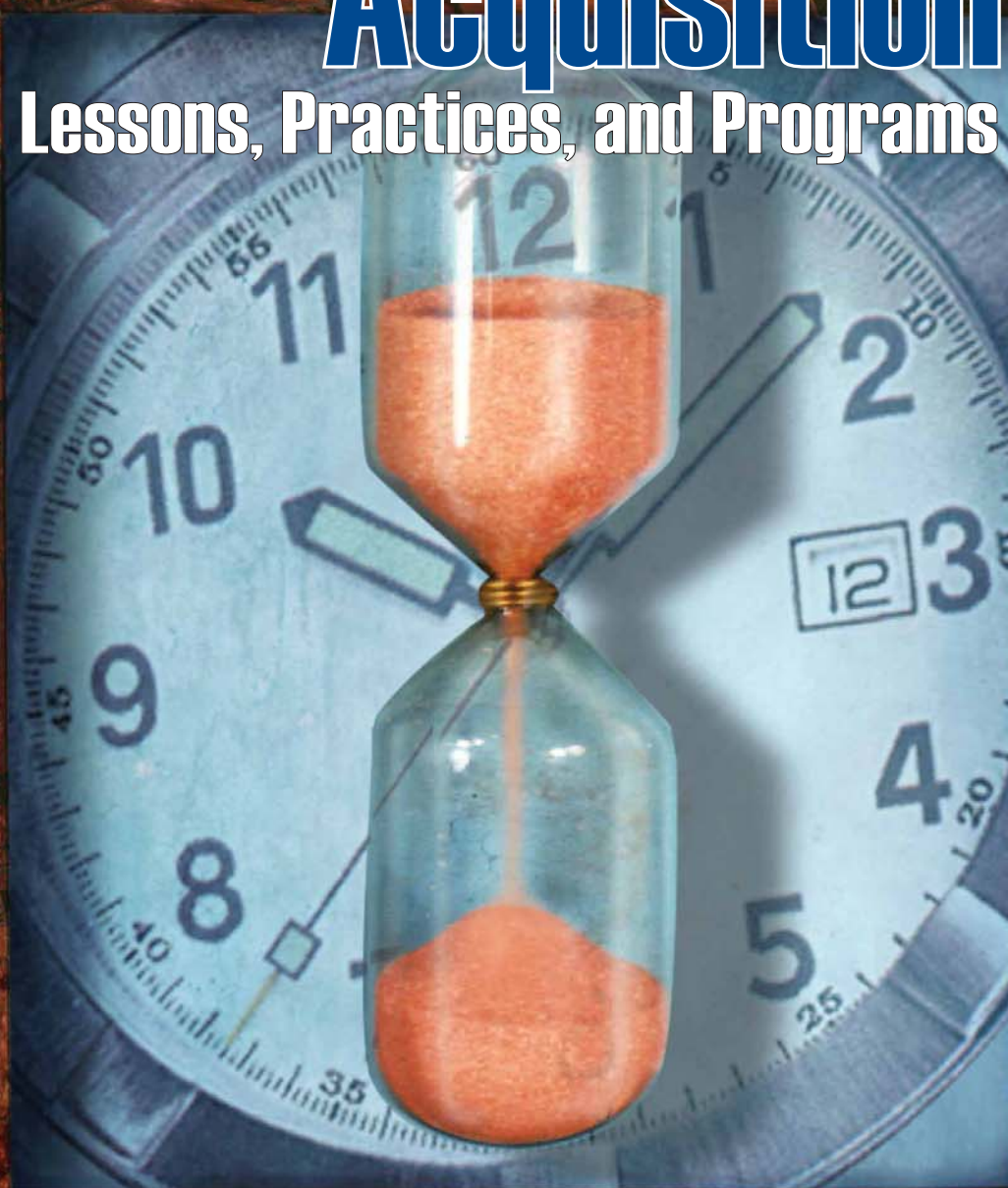


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Contracting and Acquisition

Lessons, Practices, and Programs



also in this edition:

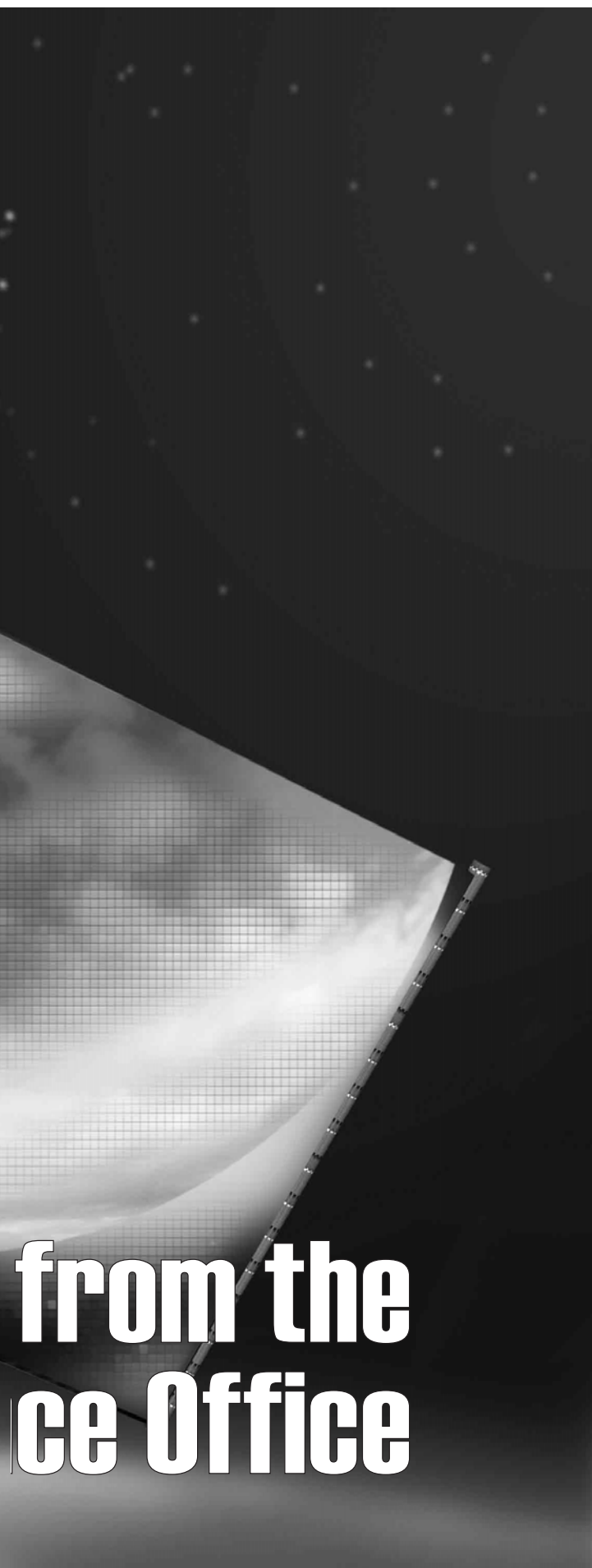
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The *Real Secret* to Acquiring Space Systems

Acquisition Secrets National Reconnaissance



Major Joe Mazur, Jr, USAF

We always have to remember that the basic purpose of the acquisition system is to provide for the needs of warfighters; get them what they need, when they need it, at an affordable cost. Our credibility suffers to the extent that we fail to meet this basic responsibility.

**Special
Feature**

—Deidre Lee, Director
Defense Procurement and Acquisition Policy

The National Reconnaissance Office (NRO) is the single national organization tasked to meet the government's intelligence needs for space-borne reconnaissance. It is responsible for unique and innovative technology; large-scale systems engineering, development, acquisition and operation of space reconnaissance systems; and related intelligence activities needed to support national security missions.¹ The NRO has a reputation as being the government's best systems acquisition and operations organization. The argument is made frequently that this is a result of special authorities or waivers to federal acquisition regulations that special access or *black* programs receive. The reality of this argument, as seen by those acquisition professionals with experience working on unclassified and classified programs, is quite different from the perception from those on the outside. Since the end of the Cold War, NRO

Characteristics of Space System Acquisition

The US will not remain the world's leading space-faring nation by relying on yesterday's technology to meet today's requirements at tomorrow's prices.

—Space Commission Report

programs such as the Future Imagery Architecture (FIA) has become immersed in much of the normal government acquisition process, while several critical *white world* space programs, such as the Evolved Expendable Launch Vehicle (EELV), receive waivers to acquisition policies that have not even been tried or authorized at the NRO.

For space acquisition programs, current Department of Defense (DoD) acquisition directives (the 5000 series) have been rewritten as National Security Space (NSS) Acquisition Policy 0301 to create an acquisition policy environment that fosters efficiency, flexibility, creativity, and innovation.² These words historically have been associated with black programs where the pursuit of breakthrough technologies in an environment of security limitations and strict need-to-know rules increased responsibility and decreased oversight. This article examines the common characteristics of space systems acquisition and then focuses on the unique organizational cultures and approaches to satellite acquisition that NRO and the Air Force take. Next, the article looks at some of the key reasons the NRO's lead in satellite acquisition has been eroding and the impact this has had on the NRO's ability to field vital national space assets. Finally, recommendations regarding the future of NRO and Air Force space acquisition practices are discussed, including a proposal to redevelop the capability to acquire breakthrough technologies with formation of a new organization with special acquisition authorities.

Within the intelligence community (IC), the NRO is responsible for classified space reconnaissance systems acquisition and operation. Within the DoD, the Air Force Space Command (AFSPC) is responsible for acquisition of space systems through its Space and Missile Systems Center (SMC) and operation of space systems through its space wings assigned to Fourteenth Air Force. This study will compare information available about one of the largest NRO acquisition programs, the Future Imagery Architecture, and one of SMC's largest acquisition programs, the EELV. While not representative of all space programs at these two agencies, these programs are sufficiently similar regarding acquisition time, value, and importance to the acquiring agency. The FIA is the first satellite acquisition where the NRO has released any significant information to the public.

This study took advantage of and did not duplicate significant research available from the Space and NRO Commission Reports, comparing the cost, schedule, and performance of NRO, the National Aeronautics and Space Administration, and Air Force space systems. The article focuses on the relative acquisition strengths of the two organizations and makes recommendations for their future transformation and roles in space procurement, not on the programmatics of the systems themselves.

Last, although this article includes information from the author's personal experience concerning the acquisition of black programs or "a program that is considered so sensitive that the fact of its existence is a 'core secret,' defined in USAF regulations as 'any item, progress, strategy, or element of information, the compromise of which would result in unrecoverable failure,'"³ the article itself contains no classified information.

For more than 40 years, NRO and the Air Force have been developing and acquiring leading-edge technology and space systems to support US military forces and the National Command Authority. These systems have included the world's first electro-optical spy satellite, Corona, whose images dispelled the *missile gap* of the Cold War, the Global Positioning System (GPS) that created a revolution in targeting capability using precision-guided munitions, and the Atlas and Titan launch systems that placed these capabilities in orbit. The US military is increasingly dependent on space systems for communications, signals and imagery intelligence, early warning, and weather forecasting. These systems are similar to their land-based brethren in that they are suffering from the *procurement holiday* of the late 1990s. The holiday is over. DoD and the intelligence community will need to replace virtually their entire on-orbit inventory over the next decade, at an estimated cost of more than \$60B.⁴

These new space systems are being acquired in a rapidly changing acquisition environment that has four principle characteristics:

- Constrained budgets
- Increased congressional oversight
- Flexible requirements process
- Changed acquisition management policies⁵

The environment has caused serious development problems and cost growth to both organizations. The NRO's FIA program "is more than a year behind schedule and \$3B over budget."⁶ In late 2002, the Air Force's Space-Based Infrared System (SBIRS)-High was at least 24 months behind schedule, and the program office estimate to complete the program was \$4B over the value of the initial contract award.⁷ As Air Force Secretary James G. Roche told the *Wall Street Journal*, in an interview published 2 December 2002, "Almost all the space programs are in trouble, and that costs [the Defense Department] billions of dollars more than expected."⁸ The following is an indepth analysis of each of the four principle characteristics that drive the acquisition of space systems.

Constrained Budgets

During the decade of the 1990s, the budgets for acquisition programs steadily declined. At the same time, an increased operations tempo and aging systems put significant pressure on operations and maintenance accounts. The NRO's motto, proudly displayed in the headquarters entrance, is *One Team—Revolutionizing Global Reconnaissance*. Some might say that the word *revolutionizing* should be replaced with *maintaining* as most of the agencies' transformational systems such as Discoverer II, which would have improved space-based radar technology, were canceled. Agencies also saw their important research and development accounts raided to cover cost growth of the replacement of systems. Recent increases in procurement budgets, as a result of the global war on terrorism, have alleviated

some of the budget pressure, but more must be done. Simple solutions such as generating more realistic budgets at the initiation of a program, emphasizing cost realism for contract award, and maintaining a management reserve for high-risk acquisitions could be implemented.

Increased Congressional Oversight

The NRO has been under increased congressional scrutiny since the revelation in the mid-1990s that it had almost \$4B in unspent procurement funds. These funds were appropriated for satellite replenishment, but significant increases in the lifespan of legacy satellites reduced the need for replacement vehicles. Therefore, the funds were not expended. The director and deputy director of the NRO were replaced as a result of this revelation, and Congress required the NRO to implement new information systems that provide greater insight and accountability over funding. The Air Force always has had strong congressional oversight, and it certainly did not decrease. Its SBIRS-High program was subject to a Nunn-McCurdy breach (25 percent increase) acquisition review by the director of the Office of the Secretary of Defense (Procurement). The purpose of this review is to determine if acquisition programs that are significantly over budget or behind schedule should be continued. It is not a rubberstamp review; several DoD programs have been canceled as a result of Nunn-McCurdy breaches.

Another type of congressional pressure is the legislated cost cap. The most significant example of this policy is in the procurement of the F/A-22, an Air Force program that has received considerable press coverage because of its cost growth. F/A-22 procurement is now set for 278 aircraft at a cost of \$470.5B, compared to a 1992 estimate of 648 fighters for \$75.5B.⁹ Within space acquisition, the FIA program has had similar, although largely unpublicized experiences. To be responsive to the request for proposal, competitors were required to submit a proposal that was under the program's budget cap, which many believed was unrealistic. As stated, FIA is now experiencing schedule delays and cost overruns.

Flexible Requirements Process

There is a growing dependence on space systems as an enabler of information operations, missile warning, navigation and synchronization, communications, tracking, and weather forecasting.¹⁰ (See Table 1 for a description of space mission areas, operational functions, and related examples of systems and activities.) The result is that space systems are receiving increased congressional and management oversight in addition to significant funding plus-ups. From a strategic perspective, there is an evolving trend toward building multimission systems capable of filling multiple roles for several customers. An example would be to add an infrared capability to an electro-optical imagery satellite, giving it the ability to spot forest fires and volcanic activity. Another example is to piggyback additional missions on existing platforms, such as putting a science experiment on a relay satellite. In either case, the cost will be less than fielding two separate systems, but much of the savings is offset by the increase in technical complexity associated with developing a multimission system. At the tactical level, the data from satellite platforms are being pushed to the user in the field, allowing near real-time use of information. Each service has a tactical exploitation of a national capabilities program that is responsible for developing new and innovative uses of national systems. This joint use of many space-

Article Highlights

Change must be made to the very culture that formed the base of space systems acquisition.

While the NRO has the reputation of being one of the government's best systems acquisition and operations organizations, it is often argued that this is a result of special authorities or waivers to federal acquisition regulations. The focus of this article is on the relative acquisition strengths of the National Reconnaissance Office and the National Aeronautics and Space Administration. While the article contains no classified information, it does include the author's personal experience with the acquisition of black programs or "a program that is considered so sensitive that the fact of its existence is a 'core secret,' defined in USAF regulations as 'any item, progress, strategy, or element of information, the compromise of which would result in unrecoverable failure.'" Research for the article indicates that the NRO must redevelop its capability to acquire the breakthrough technologies that are going to emerge as the key to the DoD's transformation process.

based assets has led to increased oversight from the Joint Requirements Oversight Council (JROC), an organization that previously had not been significantly involved in space system procurement. Existing satellites are being used in ways that had never been imagined, such as using NRO imagery satellites to track the ash from volcanic eruptions and then alerting commercial pilots to keep them from flying through it. NRO satellites have located hidden threats from space, which enabled warfighters to avoid or neutralize them without risk to friendly forces.

Changed Acquisition Management Policies

In the last few years, there has been significant turmoil in defense systems procurement, in general, and in space systems procurement, in particular. As a result of the Space Commission Report, DoD made the Air Force the primary procurer and operator of space systems by designating it the executive agent for space. For fiscal years 2002 through 2007, the Air Force, including NRO accounts, is expected to spend about 86 percent of the total programmed space funding of about \$165B, whereas the Navy, Army, and other DoD agencies are expected to spend about 8 percent, 3 percent, and 3 percent, respectively.¹² The Space Commission Report also resulted in significant changes in Air Force leadership. The position of the Assistant Secretary of the Air Force for Space, who also served as the director of the NRO, was eliminated. The functions were moved to the Under Secretary of the Air Force, who, as the number two civilian in the Air Force and director of the NRO, is responsible for the procurement of all DoD and NRO space systems. The deputy director of the NRO oversees the day-to-day operations of the NRO and IC systems, while a similar new civilian position, the Deputy for Military Space, was created to oversee unclassified

and Air Force space systems. Both deputies report directly to the Under Secretary.

Within the Air Force space organization, SMC was moved from the Air Force Materiel Command (AFMC) and placed under AFSPC. In a recent development, the SMC Commander assumed responsibilities of the program executive officer for space. The Air Force Research Laboratory's Space Vehicles Directorate, which does the majority of Air Force space research, remains under AFMC's laboratory structure. This change gives the Air Force the same cradle-to-grave acquisition and operations responsibility that the NRO always had. The Air Force also has integrated NRO's acquisition management process, called Directive 7, and the DoD 5000 series to create a unique acquisition process for space systems, NSS Acquisition Policy 03-01. One of the first steps taken in this regard was to establish the Defense Space Acquisition Board that streamlined the Defense Acquisition Board process to be similar to an NRO acquisition board (NAB). A NAB can be accomplished in weeks instead of months, and the number of people required to coordinate on the process is significantly less than previously required by the 5000 series. A key to the NAB process is use of an independent review team that presents an impartial recommendation to the NRO Director regarding the status of the system and its ability to proceed to the next acquisition milestone.

Within DoD, the most significant departure from earlier norms was the revision of the DoD 5000 series of acquisition policy. In its place, DoD has instituted a policy of evolutionary acquisition, where an evolutionary or phased approach is taken to product development. Evolutionary acquisition approaches include spiral development, cycle-time reduction, cost-of-delay analysis,

Missions	Operational Functions	Examples of Assets/Programs	Description
Space Control	Space surveillance, protection, prevention, and negation	Space surveillance network	This space control asset is a network that provides space object cataloging and identification, satellite attack warning, timely notification to US forces of satellite flyover, space treaty monitoring, and scientific and technical intelligence gathering.
Force Enhancement	Navigation, satellite communications, environmental monitoring, surveillance and threat warning, command and control, and information operations	Global Positioning System	This network of satellites and supporting ground stations provides all-weather, day/night, three-dimensional positioning information and precise timing data to land-based seaborne, and airborne US and allied forces, as well as other national security, civil, and commercial users. GPS enhances force coordination, command and control, target mapping, target acquisition, flexible routing, and weapon accuracy, especially at night and in adverse weather.
Space Support	Launch operations, satellite operations, modeling, simulation, and analysis/force development evaluation	Air Force Satellite Control Network	This is the primary command, control, and communications support capability for DOD space systems. As a network of systems, it performs a multitude of functions, including data processing, tracking, telemetry, satellite commanding, communications, and scheduling. The network has 15 worldwide fixed antennas, one transportable system, and two mission critical nodes.
Force Applications	Intercontinental ballistic missile sustainment, conventional strike	Minuteman III Sustainment	This program sustains the US strategic ballistic missile system.

Table 1. Space Missions, Operational Functions, and Examples of Related Assets and Programs¹¹

and the Warfighter Rapid Acquisition Process (WRAP).¹³ Table 2 describes recent acquisition initiatives in more detail. Although these processes are useful to the Air Force, where, for instance, GPS satellites are produced in small quantities, the NRO generally produces satellites as *one of* in a craft-manufacturing, versus production-line, process.

Supporting Data and Findings

The former distinctions between black programs, white space, military, civil, and commercial space are growing increasingly blurred and becoming virtually seamless.

—Dr James G. Roche, Secretary of the Air Force

NRO Acquisition Strengths

Since its inception, the NRO has had a reputation as the preeminent research, development, and acquisition organization in the intelligence community and DoD. Within the contractor community, it is considered “the most effective element of the US Government”¹⁴ The NRO gained this reputation by developing cutting-edge technology, solving complex systems engineering problems, fielding state-of-the-art reconnaissance systems, and delivering time-critical intelligence, all within a highly classified, need-to-know environment. There are many reasons why the NRO enjoyed such success in its past, and the following attributes are considered essential for it to maintain its present status within the acquisition community.

End-to-End Acquisition. The NRO has been unique among DoD acquisition organizations in that, in addition to acquiring intelligence systems, it also operates and maintains them. This end-to-end approach to acquisition has several significant advantages. First, the *customer* is involved in the purchase decision. The space systems operators are on the acquisition team, writing the concept of operations and the systems requirements documents. They see how the systems are operated and bring their experience back to the development of new systems, establishing a highly effective feedback loop. Second, the systems are acquired as a whole, not as separate elements; that is, the NRO is responsible for acquisition of the satellite vehicle, the launch vehicle, the command and control element, the processing system, the launch services, operations and maintenance, ground stations, security, and a host of other products and services. While the NRO is not responsible for all aspects of the intelligence cycle—such as the tasking, exploitation, and dissemination functions (Figure 1)—the collection and processing function for which it is responsible represents the largest investment in system development.

Third, NRO development contractors operate with an organizational structure that mirrors the government’s. The contractor who develops a satellite system usually will fly the satellite on-orbit. This, in itself, is a significant difference from Air Force space programs where the satellite operation is handed over to the military space operators. The program manager of an NRO system is responsible for ensuring that specifications, interfaces, and a host of other engineering and programming issues are optimized to deliver a satellite that operates correctly on-orbit. The Government and the contractor consider anything less than perfect on-orbit performance to be a failure.

Special Authorities. Acquisition authority for the NRO comes from the Director, Central Intelligence (DCI) and is delegated to the Director, NRO, who subsequently delegates the authority to

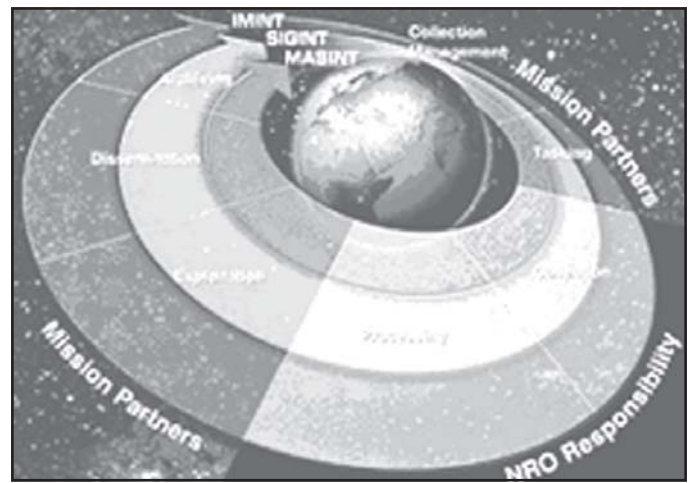


Figure 1. Today's Intelligence Process¹⁴

the NRO Director of Contracts. This acquisition authority comes from Title 50 of the US Code as opposed to the Title 10 authority of the DoD. The NRO cannot acquire weapon systems, and the DoD cannot acquire space reconnaissance systems. Within the NRO, normal DoD procurement policies, regulations, and procedures are not followed. The NRO uses Federal Acquisition Regulations (FAR) and its own procurement regulation, the *NRO Acquisition Manual* (NAM). Within the manual, the following special authorities are used:

- The NRO is not required to report to DoD in accordance with the FAR and has waivers to certain aspects of the FAR; for example, the NRO does not consider Small Business Administration (SBA) or small business subcontracting in contract awards. Informally, the NRO keeps track of its compliance with the SBA goals and meets the majority of them.
- The NRO has a waiver from full and open competition requirements. It will compete classified requirements only among those contractors who have the appropriate security clearances to receive solicitation. It has several different means to bring in new contractors to increase the pool of available contractors, but it is not required to do so. The NRO does not advertise its requirements in the *Commerce Business Daily* or any other unclassified source. With the exception of the Future Imagery Architecture, the NRO has not announced significant contract awards to either the public or Congress. In the case of the Future Imagery Architecture, only the successful offeror was announced; other information such as contract value and period of performance remained classified.
- The director of the NRO is the final acquisition approval authority for all NRO acquisitions. Authority is delegated down within the NRO, but the director does not have to go outside the NRO for any further approvals. The NRO has spent considerable time and effort involving mission partners, users, and external staffs, although it was not required to do so.
- The NRO has the ability to write both classified and unclassified contracts. There are pros and cons to using each type of contract, and procurement officials have an extensive classified contracting guide to help them decide which contract is appropriate for their situation.
- Industry can and does protest NRO contract awards. If the protests were to go above the agency level, the Government Accounting Office (GAO) could set up a special classified

court to hear the proceedings. The NRO uses alternative dispute resolution (ADR) techniques to solve protests at the agency level, if possible.

- For leasing, the NRO does not have to go through the Government Services Agency (GSA).
- For facilities, the NRO does not have to go through a DoD construction organization such as the Army Corps of Engineers.¹⁷

Experienced Personnel

Within the lobby of NRO Headquarters, a large banner was strung across the entrance with the statement *People—Our Most Valued*

Asset. In other agencies, this might be just a slogan, but at the NRO, it is a fact. The NRO is a selectively manned organization, where people hired to work already have proven they are outstanding performers within their respective agency and career field. NRO personnel are senior members of the uniformed and civilian DoD services, specifically the Air Force and Navy, and senior members of the Central Intelligence Agency (CIA). Because of their experience and qualifications, NRO employees work with little supervision and a high degree of empowerment. Major systems are acquired by system program offices (SPO) using integrated product teams whose members can make

Organizational Description	
Air Force as Executive Agent for Space.	In response to the Space Commission's recommendation, the Secretary of Defense issued a memorandum directing that the Air Force be designated the executive agent for space within DoD, with department-wide responsibility for planning, programming, and acquiring space systems.
Milestone Decision Authority.	The Under Secretary of Defense for Acquisition, Technology, and Logistics gave the Secretary of the Air Force milestone decision authority for acquiring DoD space systems. The Secretary redelegated this authority to the Under Secretary of the Air Force/Director, NRO.
National Security Space Integration (NSSI).	This office was established to guide and coordinate implementation of the Space Commission's recommendations. It is charged with providing program plans, policy integration, and acquisition support among other activities. It also will be responsible for leading, developing, maintaining, and coordinating the national security space plan. NSSI is located within the Air Force, reporting to the Under Secretary of the Air Force/Director, NRO.
National Security Space Architect.	This office is responsible for developing architectures to guide new systems acquisitions and ensure that they can work together effectively. It also will be responsible for ensuring that Air Force and NRO funding for space is consistent with policy, planning guidance, and architectural decisions and preparing an annual National Security Space Program assessment.
Funding	
Space is designated a <i>virtual</i> major force program.	The Space Commission recommended that a <i>major force program</i> be established to improve management and oversight of space programs. A major force program is a DoD budgeting mechanism that aggregates related budget items into a single program to track program resources independent of the appropriation process and contains the resources needed to achieve an objective or plan. Instead of creating a separate major force program for space, DoD established a <i>virtual</i> major force program to increase visibility of resources allocated for space activities. The virtual major force program identifies spending on space activities within the other major force programs and provides information by functional area.
Acquisition Management and Oversight	
Best practices incorporated into DoD acquisition policy.	DoD acquisition policy (DoD 5000 series for acquisition) to embrace acquisition practices that characterize successful programs for acquiring and developing systems. These focused primarily on making sure technologies are demonstrated to a high level of maturity before beginning product development and taking an evolutionary or phased approach for producing a system. The changes represent substantially different ways of doing business for DoD in that they essentially would separate technology development from a weapon system or space system development program and deliver capabilities in phases versus one <i>big bang</i> . This was done to curb incentives to overpromise the capabilities of a new system and rely on immature technologies and make sure that technologies and funds are available to make good on promises.
Defense Space Acquisition Board.	To reduce oversight time for space programs, DoD set up the Special Defense Space Acquisition, Review Board modeled after one employed by the NRO, which will have one layer of review at each major milestone throughout the acquisition process. Under this new oversight process, the team would spend about 8 weeks onsite working full time with program officials and conclude this work with recommendations to the board on whether or not to allow the program to proceed. DoD anticipates that the new process will decrease milestone decision cycle time from about 8 to 12 months to about 8 to 12 weeks.
Other practices being considered for improving space program acquisition.	The DoD also is looking to apply other practices considered by the Air Force and Army as best practices for inclusion on space program acquisition. For example, the NRO will be evaluating the possibility of using a best commercial practice for project selection approval and funding, referred to as WRAP, that is to facilitate rapid deployment of new technology and capabilities. The WRAP currently is evolving from a new program start process to a new technology insertion program. Another practice under study is strategic supplier alliances that would establish long-term comprehensive supplier partnerships to leverage the purchases of material, products, and services in a more effective and efficient manner.

Table 2. Recent Acquisition Initiatives¹⁶

decisions generally not associated with their level in government. In general, military team members are O-4s and above, and civilians are GS-13 and above. Program managers are O-5 and above or GS-15 and above. SPO directors are O-6 and above or civilian members of the Senior Intelligence Service. The lines of authority at the NRO are very short, and senior officials are accessible when their decisions are required. The normal tour at the NRO for military and civilians is 3-5 years, with many returning on a rotational basis.

NRO Acquisition Weakness—FIA Requirements Process

Dr Marvin Sambur, Assistant Secretary of the Air Force for Acquisition, in reference to Air Force acquisition cycle times, said, "On average, Air Force programs' cycle times run about 10 years, and that's only the average; some programs take up to 25 years to get to the field."¹⁸ Acquisition cycle times at the NRO run about 7 years, on average. The FIA program, despite a sophisticated 18-month requirements process, is well on track to exceed this average. The system currently is at least 2 years behind schedule and \$3B over budget. In its haste to be all inclusive to the DoD and IC community, NRO experienced a common problem that any program manager can relate to—too many customers bringing too many requirements with too few financial resources to back them up. The successful FIA contractor cannot build the required system within the government's cost cap, resulting in both a reduction in requirements and a cost growth on the program. In addition, at least one mission partner that participated in the requirements process—the National Imagery and Mapping Agency (now the National Geospatial Intelligence Agency)—did not budget sufficient resources for its exploitation, dissemination, and archiving function, leaving the NRO and DoD to find additional resources to complete the system. Finally, the FIA requirements were put through reviews, such as the JROC, that are not required of intelligence systems. There may be some benefit in coordinating requirements with your largest user, the DoD, especially in the joint environment that characterizes acquisition today, but a more effective process would have been to provide the JROC with status, not approval briefings. The NRO has had unparalleled success in delivering intelligence systems despite incredible setbacks. The first imagery program, Corona, had 13 successive failures prior to its first success. Unfortunately, with the FIA program, the NRO and our nation cannot afford failure. The total acquisition value of the FIA program is classified, but it is the largest contract that the NRO has awarded to date.

Air Force Acquisition Strengths

The Secretary of Defense has the authority to extend many of the special authorities used by the NRO to the DoD acquisition community. In fact, Rumsfeld, in a 2 January 2003 memo, gave the Missile Defense Agency special authority to acquire a ballistic missile defense system with streamlined acquisition procedures and a new, more flexible oversight process.¹⁹ Within the Air Force, the Secretary of the Air Force has established pilot programs to implement innovative acquisition processes.²⁰ One such program, EELV—which will replace the existing Delta, Atlas, and Titan launch vehicles—was the subject of the research for this article. While not immune to bureaucracy, the EELV program was unique in that it was granted special authorities and

increased flexibility through the use of acquisition reform initiatives, as outlined below.

Special Authorities. For the initial development of the EELV program, the Air Force elected not to use a traditional FAR-based contract, which specifies literally hundreds of mandatory requirements, such as subcontracting reports, patent rights certifications, open access for audits, and the related government oversight. Instead, the Air Force used Section 845 of the National Defense Authorization Act (PL 103-160) Other Transaction (OT) authority. Section 845 OT authorities are used principally by the Defense Advanced Research Projects Agency to acquire prototype systems and were used in the initial development of many of the unmanned air vehicles used so successfully in Operations Enduring Freedom and Iraqi Freedom. Other transactions are used when the Government is trying to encourage innovation by defense contractors and, in the case of EELV, could be used because the contractors were funding at least one-third of the total cost of the project (\$500M of \$1.5B).²⁰ The disadvantage of other transactions is that, although they are fixed-price, technically, there is no contract, and the contractors actually are not required to deliver any specific product beyond their best efforts. The Government is technically a silent partner with almost no control over contractor spending and decisionmaking.²² Because of these drawbacks, subsequent EELV purchases, beyond the first lot, were made under FAR Part 12, *Commercial Acquisition*, rules.

Increased Flexibility Through Acquisition Reformation Initiatives. The EELV program was developed using the latest acquisition reform initiatives available when its acquisition strategy was approved in June 1998. The initiatives included:

- A streamlined chain of command with a single program manager with the responsibility, authority, and accountability to execute the program;
- Single acquisition management plan to streamline routine acquisition documentation;
- SPO limited to 106 experienced personnel;
- SPO personnel supplemented by Aerospace Corporation (a federally funded research development center) and Defense Contract Management Agency personnel;
- Minimal contract data requirements list items;
- Limited key performance parameters;
- Use of government and contractor integrated product teams;
- Use of commercial off-the-shelf components; and
- No military specifications.²⁴

The use of these acquisition initiatives and special authorities significantly enhanced the ability of the EELV program office to deliver its product on time, if not on budget. In early 2003, each contractor was able to launch its first EELV successfully, a little more than 5 years after award of the other transactions and well within the traditional 7-year space system development time line.

Air Force Acquisition Weaknesses

The Air Force certainly has had its share of flawed acquisition planning and workforce issues, which have developed into acquisition cost growth and schedule slips on several very visible programs, such as the F/A-22. Within Air Force space systems procurement, flawed acquisition planning has affected many programs from their inception. Acquisition workforce

issues, although not a problem when the program started, are now beginning to affect SMC's ability to implement the EELV program.

Flawed Acquisition Planning. Within months of awarding two \$500M fixed-price other transactions to Boeing and Lockheed-Martin, the Air Force discovered that Congress, in the fiscal year 1999 Defense Appropriations Act, reduced the development program funding by \$20M. Technically, this reduction, if it had not been corrected in a later budget, would have put the Air Force in default of the OT agreement.²⁴ Now, because of bad assumptions regarding the future strength of the commercial launch market, the Air Force will have to increase its share of the development funds by \$350M if it hopes to keep both contractors in the market.²⁵ In addition, the Air Force no longer considers the EELV to be a commercial item, and future launch vehicles will be negotiated under the rules of FAR Part 15.

Acquisition Workforce Issues. Two key strengths of the EELV program when it was initiated were "a single program manager with the responsibility, authority, and accountability to execute the program" and "in general, only senior and mid-level captains and civilians are employed on the IPTs, most with prior SPO experience."²⁶ A recent Booz-Allen study of space system development growth noted "a lack of program manager continuity" and a "gap in relevant experience" as a result of delegating traditional government-owned acquisition management functions to development contractors through total system performance responsibility during the 1990s.²⁷ In addition, the study noted that there was an increase in the ratio of junior to senior level personnel. Without significant changes, the workforce manning issues are going to increase, putting into question the ability of SMC to find the experienced workforce to implement another program like today's EELV.

Significant Findings

There are three significant findings as a result of the research accomplished for this article. First, NRO and the Air Force have distinct organizational cultures and approaches to the acquisition of a similar commodity—space systems. These cultures are an artifact of the unique history of each organization, its successes and failures, management, personnel, facilities, and view within the DoD. Second, the NRO—with its connection to the CIA and Director, Central Intelligence—developed significant acquisition strengths that enabled it to acquire complex satellite systems successfully. The strengths include its end-to-end approach to systems development, special acquisition authorities, and a cadre of experienced personnel. Over time and with its most recent large program acquisition, Future Imagery Architecture, the NRO has allowed the key enablers to its success, its culture and acquisition strengths, to erode to the point that the organization is better equipped to maintain its legacy systems than it is to acquire the cutting-edge technology that will be required in the future. This erosion of capability comes at the same time the Air Force, with unclassified programs such as EELV, is able to implement many of the same, if not more, acquisition authorities and processes previously limited to the NRO.

Conclusion

As we prepare for the future, we must think differently and develop the kinds of forces and capabilities that can adapt quickly to new challenges and to unexpected circumstances. We must transform not only the capabilities at our disposal, but also the way we think, the way we train, the way we exercise, and the way we fight. We must transform not only our armed forces, but also the department that serves them by encouraging a culture of creativity and prudent risk-taking. We must promote an entrepreneurial approach to developing military capabilities, one that encourages people to be proactive, not reactive, and anticipates threats before they emerge.

—Donald H. Rumsfeld, Secretary of Defense

The global war on terror, the current Presidential administration, Secretary of Defense, and Secretary and Chief of Staff of the Air Force present the perfect storm of opportunities to change or transform the acquisition of US space systems. Never before have so many senior officials in the acquisition management chain agreed that changes must be made, not just to the regulations and approaches but to the very culture that formed the base of space systems acquisition. Two recent congressional commissions, the Space Commission and NRO Commission, add their significant weight to the revitalization of space acquisition.

The recommendations of this study are twofold. First, NRO and the Air Force, through SMC, should continue to work at merging their best acquisition practices. The principle outcome of this merger would be a change in Air Force acquisition culture toward more streamlined and efficient acquisition through the use of the NRO's Directive 7 and NAB processes. This work has been completed significantly with the release of NSS Acquisition Policy 03-01. Second and more important, the NRO must look back to its acquisition heritage and redevelop its capability to acquire, rapidly and efficiently, the breakthrough technologies that are going to emerge as the key to the DoD's transformation process.

One approach, as recommended by the Space Commission, is to develop, within the NRO, what the commission termed an office of space reconnaissance, based on Lockheed's famous *Skunk Works* model, to handle the toughest and most complicated acquisitions. The NRO would continue to handle the operations and maintenance of existing legacy programs and develop the less cutting-edge systems.

The revolutionary organization would be staffed by experienced government and civilian workers from the military services and CIA. This program staff generally would be on, at least, their second or third tour in space acquisition. They would receive wide latitude from management, including unique special authorities; the ability to pursue a streamlined acquisition process; and other tools, especially full funding, to ensure their success. While organizationally a part of the NRO, administratively the revolutionary organization would operate as a separate entity with its own budget and separate security controls. The implementation of a revolutionary organization is the key to regaining the lost culture of the NRO pioneers, the individuals and groups that established space reconnaissance with the launch of the Corona program. It is our legacy to prove historian William H. Gregory wrong when he stated, "Military

buying has become fixed in the public mind as spending billions and, often as not, producing a turkey, not an eagle.”²⁸

Notes

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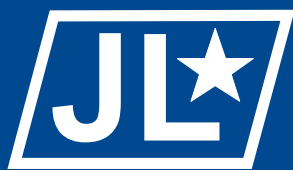
notable quotes

Every logistics dollar expended on outdated systems, inefficient or excess capability, and unneeded inventory is a dollar not available to build, modernize, or maintain warfighting capability.

**Paul G. Kaminski, Under Secretary of Defense
for Acquisition and Technology**

It has been heartening to see so many nations agree democracy is the best system of government. But there are important steps between consensus and reality. Democracy is learned behavior.

William J. Perry, Secretary of Defense



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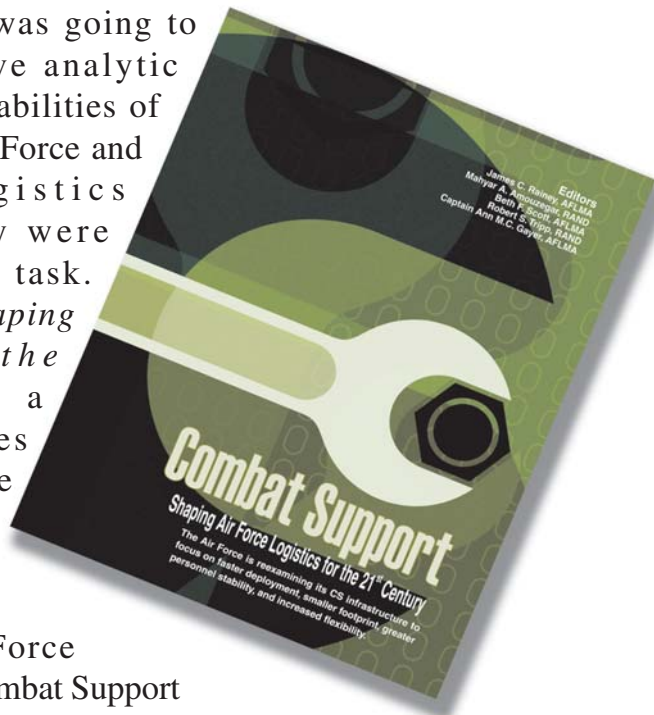
Contacting the Journal Staff

We've relocated to temporary facilities at Maxwell AFB, Alabama, while our permanent home is undergoing renovation. Planning is for a return to the Gunter Annex address in late 2004. Our temporary address and phone numbers are listed below.

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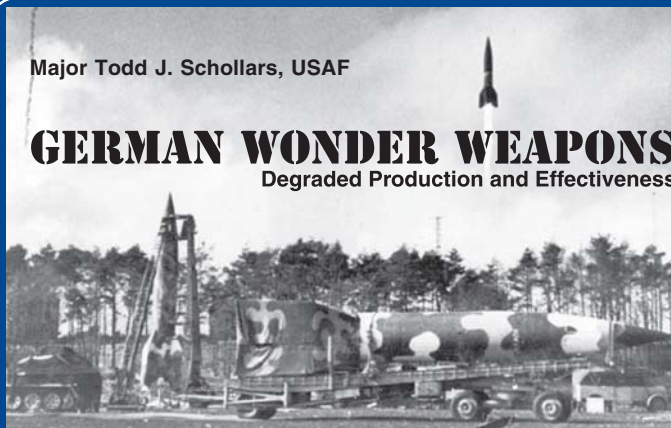
In 1996, shortly after Operation Desert Strike, concern about the long-term requirements of enforcing the no-fly zones, including covering *the carrier gap*, led to the initial concept of an air and space expeditionary force. At that time, the Deputy Chief of Staff, Operations, Lieutenant General John P. Jumper, realized that transforming the Air Force to a more expeditionary footing was going to require comprehensive analytic study. The unique capabilities of both RAND Project Air Force and the Air Force Logistics Management Agency were harnessed to take on this task. *Combat Support: Shaping Air Force Logistics for the 21st Century* is a compilation of articles that communicates the essentials of the analyses completed over the last 6 years. The research was conducted to help the Air Force configure the Agile Combat Support system in order to meet AEF goals.



Major Todd J. Schollars, USAF

GERMAN WONDER WEAPONS

Degraded Production and Effectiveness



The Editorial Advisory Board selected "German Wonder Weapons: Degraded Production and Effectiveness"—written by Major Todd J. Schollars—as the most significant article to appear in Vol XXVII, No 3 of the *Air Force Journal of Logistics*.